6.0 Grand Junction, Colorado, Disposal Site

6.1 Compliance Summary

The Grand Junction Disposal Site, inspected on March 11, 2003, was in good condition. A portion of the disposal cell remains open and is operated by DOE to receive additional low-level radioactive waste materials from various sources. The annual inspection addresses only the closed and completed portion of the disposal cell and surrounding disposal site.

Erosion in a drainage ditch along the access road was threatening to damage the road and subsequently was repaired. An eroded storm water ditch along the north property boundary also was repaired. Plants, primarily annual weeds, are continuing to encroach on the disposal cell, especially on the south side. Vegetation on the reclaimed former ramp area on the east side of U.S. Highway 50 is slowly establishing. No cause for a follow-up or contingency inspection was identified.

6.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Grand Junction, Colorado, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Interim Long-Term Surveillance Plan* [LTSP] *for the Cheney Disposal Site Near Grand Junction, Colorado* (DOE/AL/62350–243, Rev. 1, U.S. Department of Energy [DOE], Albuquerque Operations Office, April 1998), and in procedures established by the DOE office at Grand Junction to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 6–1.

Table 6–1. License Requirements for the Grand Junction, Colorado, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.0	Section 6.3.1
Follow-up or Contingency Inspections	Section 3.0	Section 6.3.2
Routine Maintenance and Repairs	Sections 2.7.3 and 4.0	Section 6.3.3
Ground Water Monitoring	Section 2.6	Section 6.3.4
Corrective Action	Section 5.0	Section 6.3.5

6.3 Compliance Review

6.3.1 Annual Inspection and Report

The site, located south of Grand Junction, Colorado, was inspected on March 11, 2003. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 6–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

6.3.1.1 Specific Site Surveillance Features

Site Access Gate, Access Road, and Entrance Gate—The site access gate is a steel, double-swing stock gate that is secured by a chain and DOE padlock. The gate, in excellent condition, controls access to the site from U.S. Highway 50. A paved all-weather access road extends approximately 1.7 miles east along DOE's perpetual right-of-way, through federal land administered by the U.S. Bureau of Land Management (BLM), to the site entrance gate. The site entrance gate is a double-swing chain link gate in excellent condition, and is secured by a DOE padlock keyed the same as the site access gate. The fence along the right-of-way corridor was in good condition.

The drainage ditch along the south side of the access road had diverted into an arroyo that passes
6A under the road near the site access gate. Significant erosion had occurred at this location and threatened to undercut the road; therefore, the drainage ditch and erosion damage were repaired.

Entrance and Perimeter Signs—The entrance and 29 perimeter signs, installed on galvanized steel posts set in concrete, were in excellent condition.

Additional warning signs are posted on the wire perimeter fence and are associated with the operation of the open cell. "Controlled Area" signs and "No Trespassing" signs are secured to the fence in pairs (PL–1). There are 75 warning sign locations, each about 200 feet apart along the site boundary.

Site Marker and Boundary Monuments—Granite site markers will not be installed at this site until the entire disposal cell is closed.

The site has four permanent boundary monuments, one at each of the four corners. The monuments mark the exact location of the site corners. All were in excellent condition and adequately protected.

Monitor Wells—The ground water monitoring network consists of three monitor wells. All three wells are inside the site boundary. The wells were secure and in excellent condition.

6.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into five areas referred to as transects: (1) the closed portion of the disposal cell; (2) the diversion structures and drainage channels; (3) the area between the disposal cell and the site boundary; (4) the site perimeter; and (5) the outlying area.

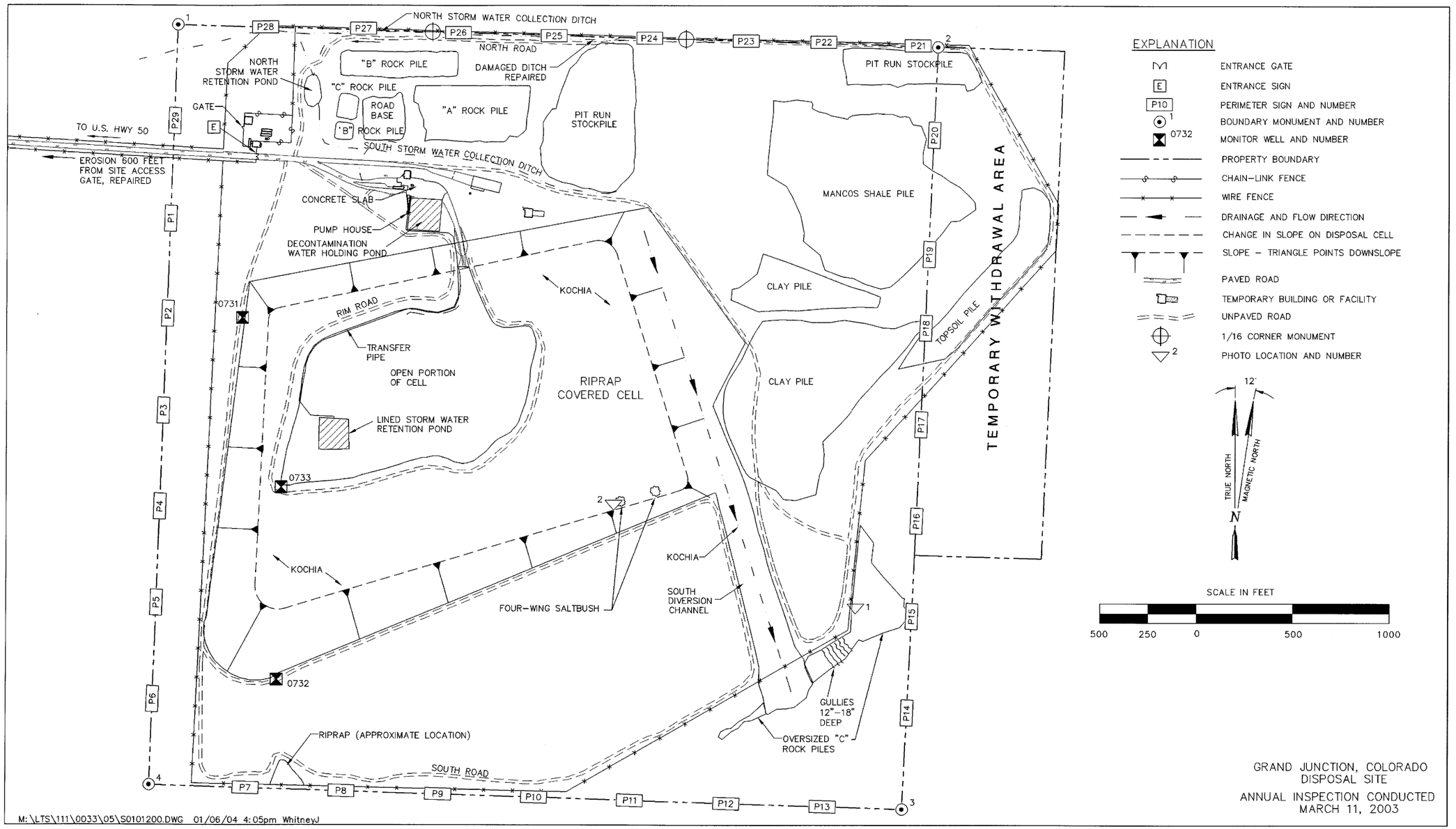

Figure 6–1. 2003 Annual Compliance Drawing for the Grand Junction, Colorado, Disposal Site

Closed Portion of the Disposal Cell—DOE will manage the open portion of the cell at the disposal site to accept waste until 2023 or until the cell is filled to its design capacity. The annual inspection does not include the open cell or the temporary structures associated with the operation of the open cell, except as they may affect the long-term safety and performance of the closed portion of the disposal cell. The open cell occupies approximately 7 acres in the center of the disposal cell. A lined retention pond is at the bottom of the open cell to collect storm water to prevent infiltration. Water in the pond is used for dust control when waste materials are being placed in the cell.

The top and side slopes of the disposal cell are covered with rounded cobbles consisting primarily of durable basalt. An undetermined but small percentage of sedimentary cobbles are breaking apart; however, the rock on the top and side slopes overall was in good condition. There was no evidence of settlement or slope instability.

Minimal plant encroachment was observed on the side slopes. However, plant encroachment is occurring on the cell top, mostly on the southeastern part of the cell (PL–2). Deep-rooted plants, which were cut back and treated with herbicide in 2001, may change the performance characteristics of the radon/infiltration barrier. An investigation is underway by DOE to evaluate
6B whether or not the deep-rooted vegetation needs to be controlled. Until the evaluation is completed, these plants will be controlled.

Diversion Structures and Drainage Channels—The south diversion channel, a large riprap-armored structure that conveys storm runoff from the disposal cell southeast into a natural drainage that flows away from the site to the southwest, was in excellent condition. Some minor plant growth, mostly kochia and Russian thistle, exists within the channel; however, there was not enough plant growth to impede water flow within the channel.

Other drainage features at the site include north and south storm water collection ditches and a storm water retention pond. These features are along the northern edge of the disposal site. The ditches are small and unimproved.

The north storm water collection ditch captures runoff from a large catchment area north and east of the disposal site. Water captured in this ditch flows into a large natural drainage north and west of the disposal cell. The north road crosses the north storm water collection ditch between
6C perimeter signs P24 and P25. Tire ruts had caused water to leave the collection ditch and flow down the road. The ditch was reconstructed and the road was repaired in 2003.

The south storm water collection ditch collects onsite storm water from the cover material stockpile areas and other places across the northern part of the site. This ditch flows west into the north storm water retention pond. A second ditch flows south into the north storm water retention pond. Both ditches are small and are filling with sediment and weeds, but continue to convey water without overtopping. There was no evidence of the retention pond overtopping.

Area Between the Disposal Cell and the Site Boundary—In addition to the temporary buildings and structures used for disposal cell operations, 12 discrete stockpiles of rock and soil are located in areas north and east of the disposal cell. These materials eventually will be used by DOE to cover and close the open cell.

Rill erosion is occurring on some of the soil stockpiles, but there was no indication of off-site sediment transport. Natural vegetation is establishing on these stockpiles and eventually will hold the soil in place.

On the south and west sides of the disposal site, between the disposal cell and the perimeter fence, the ground is relatively flat and covered with native vegetation that consists primarily of perennial grasses and small shrubs. Unlike the areas north and east of the disposal cell, the areas south and west are mostly undisturbed. No erosion was observed south and west of the disposal cell.

Site Perimeter—The perimeter fence surrounding the site consists of a combination of square wire mesh at the bottom and two strands of barbed wire along the top, both supported by steel t-posts. The fence was in good condition and there was no evidence of livestock entering the enclosed area.

The fence runs along or near the property line on the north and south sides of the site, about 200 to 300 feet inside the property line on the west, and as much as 1,000 feet inside at the southeast corner of the site. On the east side, the fence extends beyond the site boundary to enclose part of an adjoining 40-acre temporary withdrawal area that is federal land administered by BLM. The temporary withdrawal area is not included in the interim LTSP and, therefore, is not formally inspected. DOE uses the temporary withdrawal area to stockpile cover materials for the eventual closure of the open cell.

Outlying Area—The area outward from the disposal site for a distance of 0.25 mile was visually inspected. Most of the land surrounding the site is rangeland administered by BLM. The land is covered by native grass and shrubs, and is used primarily for cattle grazing. No development or disturbance that could affect the disposal site was observed.

An overpass formerly crossed U.S. Highway 50 along the old haul road between the railroad off-loading area and the disposal cell. The overpass and access ramps were removed in the spring of 1998. Although the access ramp area on the east side of the highway was recontoured, rill and gully erosion was occurring on the southern and western parts of the former ramp area. This access ramp area was regraded and hydroseeded in the fall of 1999. Grasses and weeds are beginning to establish and are helping to stabilize the soil surface. No evidence of rill or gully erosion was noted in 2003. Successful revegetation is expected to take several years in the arid climate where the disposal cell is situated, and the area will continue to be monitored.

6.3.2 Follow-up or Contingency Inspections

No follow-up or contingency inspections were required in 2003.

6.3.3 Routine Maintenance and Repairs

Erosion damage to the drainage ditch along the access road was stabilized and damage to the north storm water collection ditch and associated north road were repaired in 2003.

6.3.4 Ground Water Monitoring

Monitoring of ground water in the uppermost aquifer (Dakota Sandstone) beneath the disposal site is not required because the ground water is of limited use, based on the total dissolved solids (TDS) content exceeding 10,000 milligrams per liter (mg/L) (40 CFR Part 192.21(g)). Confined ground water in the uppermost aquifer lies approximately 750 feet below the existing ground surface and is hydrogeologically isolated from the tailings material by mudstones and shales of the Mancos Shale.

In lieu of monitoring ground water in the uppermost aquifer, ground water in two monitor wells in or very near buried alluvial paleochannels adjacent to the disposal cell (MW−0731 and MW−0732) and one monitor well in the disposal cell (MW−0733) is monitored to assess performance of the disposal cell and to ensure that any water in the paleochannels is not impacted by seepage (transient drainage) from the disposal cell (Figure 6−1). The paleochannel wells are along the west (downgradient) edge of the disposal cell and are screened at the interface between the alluvium and shallow Mancos Shale. The third well is in the southwest corner of the open portion of the disposal cell and is used primarily for measurement of water levels in the deepest part of the disposal cell to demonstrate that intracell water will not rise high enough to move laterally into the paleochannels. The water level in the disposal cell well is approximately 35 and 10 feet lower (deeper) than water levels in the paleochannels at MW−0731 and MW−0732, respectively (Figure 6–2). This indicates that ground water cannot seep from the disposal cell to the paleochannels.

Samples are analyzed for standard field parameters and the following indicator analytes: molybdenum, nitrate, selenium, sulfate, TDS, uranium, vanadium, and polychlorinated biphenyls (PCBs). Analytes with maximum concentration limits (MCLs) established in Table 1 to Subpart A of 40 CFR 192 are molybdenum, nitrate, selenium, and uranium.

Results from sampling in 2003 were consistent with results from the past several years. Molybdenum and vanadium concentrations in ground water continued to be near or below the required laboratory detection limits and significantly below the MCL or risk-based standard at all wells. Nitrate concentrations exceeded the MCL of 44 mg/L in MW−0732 and MW−0733, but were below the MCL in MW−0731 (Figure 6–3). Selenium levels continued to exceed the MCL of 0.01 mg/L at both downgradient wells and remained below the standard at MW−0733 (Figure 6−4). Sulfate concentrations continued to be relatively high in all wells, at approximately 6,700 mg/L in the disposal cell, and just below 4,000 mg/L in the paleochannel wells. High sulfate concentrations are typical of the regional soils, which contain gypsum. Concentrations of TDS continued above 10,000 mg/L in the disposal cell well. Concentrations of TDS in ground water in the paleochannel wells were around 7,000 mg/L. Uranium concentrations were just below the MCL of 0.044 mg/L in MW−0731, and were substantially below the MCL in MW−0732 and MW−0733 (Figure 6–5). PCBs were not detected in the samples from any of the wells.

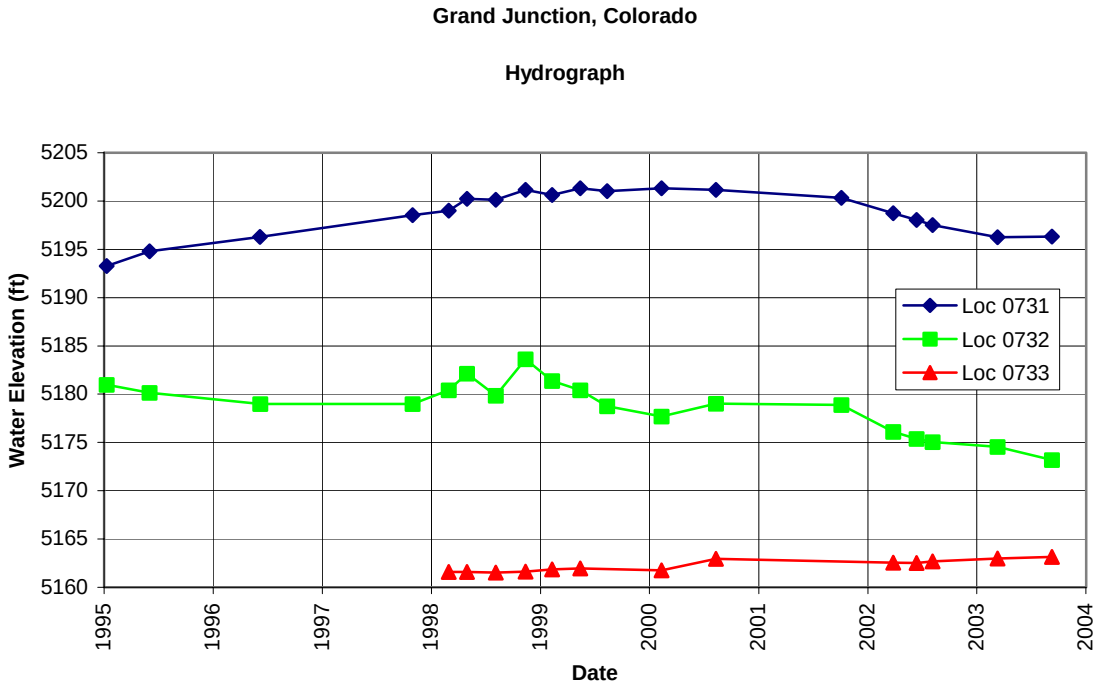

Figure 6−2. Water Level Measurements at the Grand Junction, Colorado, Disposal Site

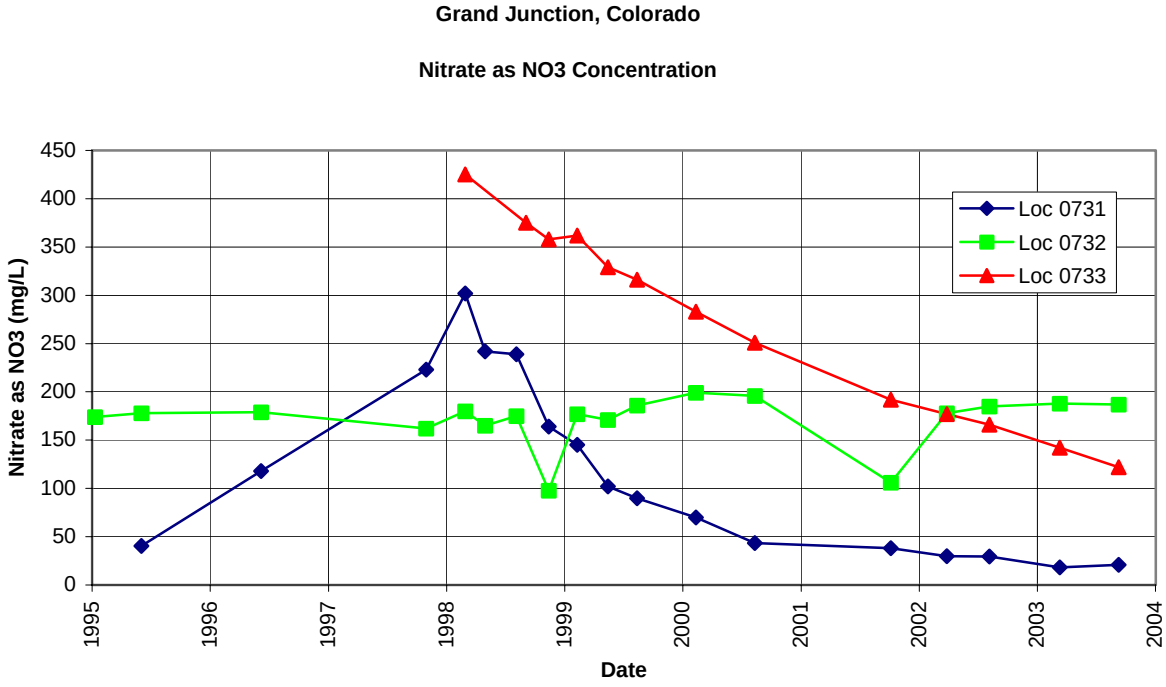

Figure 6−3. Time-Concentration Plots of Nitrate (as NO_3) in Ground Water at the Grand Junction, Colorado, Disposal Site

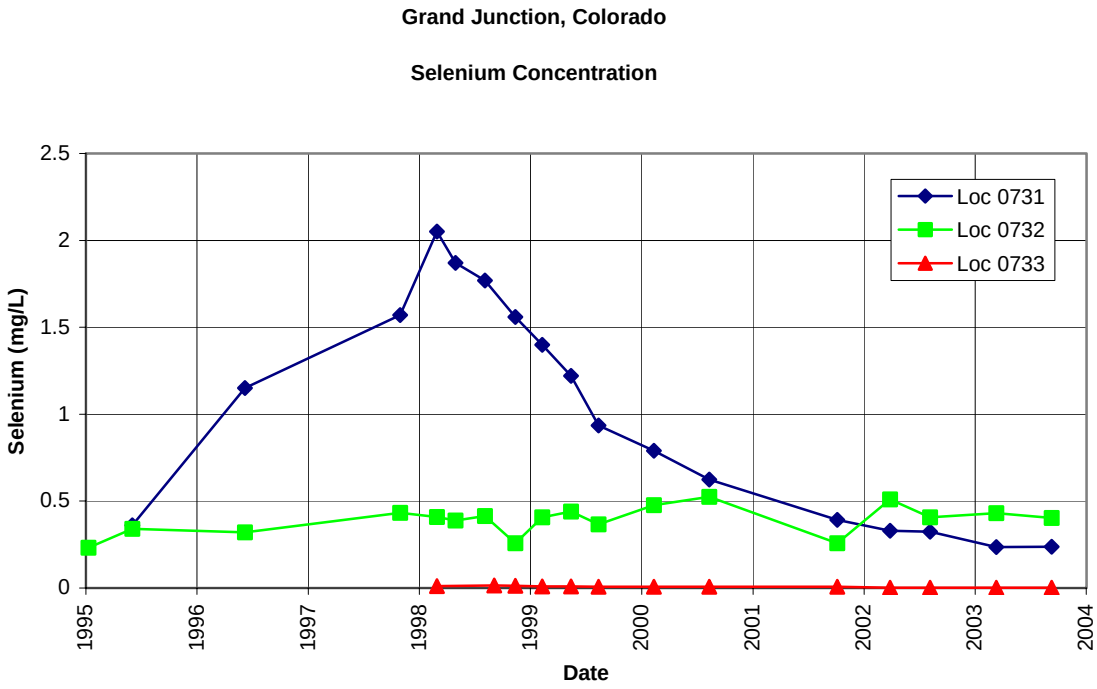

Figure 6−4. Time-Concentration Plots of Selenium in Ground Water at the Grand Junction, Colorado, Disposal Site

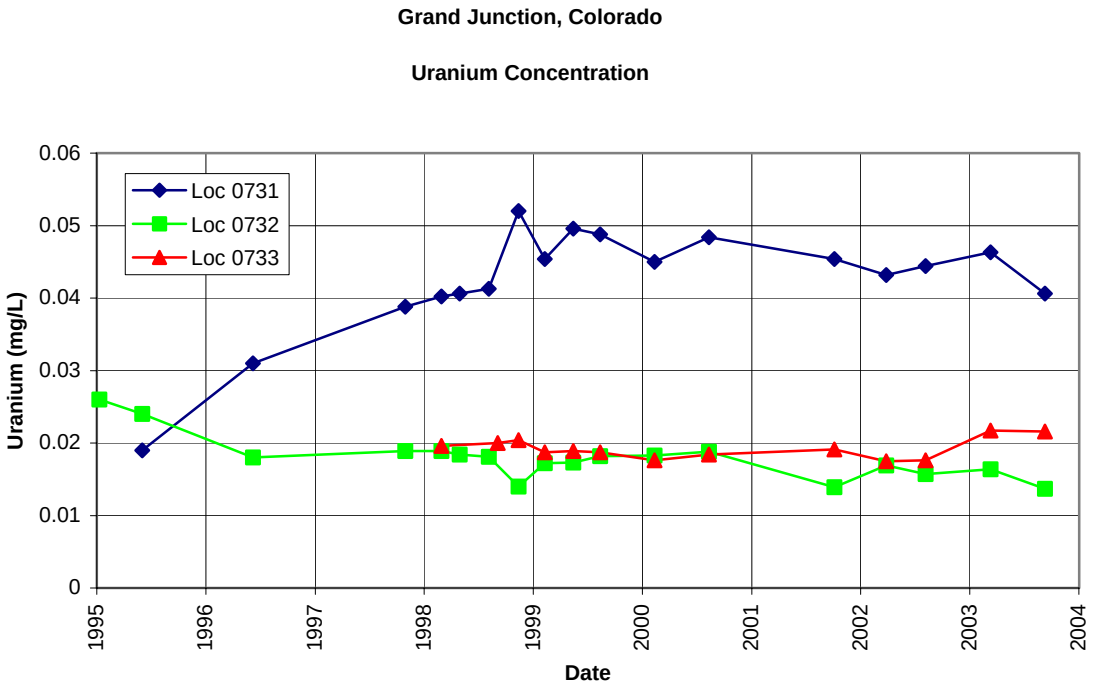

Figure 6−5. Time-Concentration Plots of Uranium in Ground Water at the Grand Junction, Colorado, Disposal Site

6D Monitoring results indicate ground water in the paleochannels has not been affected by transient drainage from the disposal cell. This is expected because water levels in the paleochannels are higher than in the disposal cell. Elevated levels of nitrate, sulfate, and uranium in ground water in the paleochannels are most likely due to leaching of natural soils and weathered shale around the paleochannels. Increased runoff from the cell surface may have increased moisture in the soils, paleochannels, and weathered shale around the disposal cell, which would increase the mobility of naturally occurring concentrations of nitrate, sulfate, and uranium in these materials.

6.3.5 Corrective Action

Corrective action addresses out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2003.

6.3.6 Photographs

Table 9–2. Photographs Taken at the Grand Junction, Colorado, Disposal Site

Photograph Location Number	Azimuth	Description
PL–1	290	Warning signs on the perimeter fence.
PL–2	15	Scattered vegetation on cell top near the southeast corner of disposal cell.

GRJ 03/2003. PL–1. Warning signs on the perimeter fence.

GRJ 03/2003. PL–2. Scattered vegetation on cell top near the southeast corner of disposal cell.

End of current section